

REMARKS

Applicants have carefully considered the September 21, 2006 Office Action, and the amendments above together with the comments that follow are presented in a bona fide effort to address all issues raised in that Action and thereby place this case in condition for allowance. Claims 1-8 were pending in this application. In response to the Office Action dated September 21, 2006, claim 7 has been canceled and claim 1 has been amended. Care has been exercised to avoid the introduction of new matter. Adequate descriptive support for the present Amendment should be apparent throughout the originally filed disclosure as, for example, the depicted embodiments and related discussion thereof in the written description of the specification. Applicants submit that the present Amendment does not generate any new matter issue. Entry of the present Amendment is respectfully solicited. It is believed that this response places this case in condition for allowance. Hence, prompt favorable reconsideration of this case is solicited.

Claims 1-7 were rejected under 35 U.S.C. § 103 for obviousness predicated upon Arimondi et al. (U.S. Pat. App. Pub. No. (2005/0072192, hereinafter "Arimondi") in view of Nagayama et al. (U.S. Pat. App. Pub. No. (2002/0059816, hereinafter "Nagayama"). Applicants respectfully traverse.

Claim 1 has been amended to include the subject matter of claim 7 (now cancelled). At page 4 of the Office action, the Examiner asserted that Arimondi, at numbered paragraph [0107], discloses a thermal treatment step of the optical fiber preform in the presence of oxygen. The Examiner concluded that it would have been obvious to one of ordinary skill in the art at the time the invention was made to treat the preform in the presence of oxygen to remove impurities and to inherently expect that the holes in the preform would have oxygen, since the oxygen was present in the treatment step. Applicants respectfully traverse.

Arimondi, at numbered paragraph [0107] discloses:

The aerogel core preform 83 may then be sintered in the sintering furnace 30, so as to obtain an intermediate glass core preform 84 (FIG. 6g) having the same ratio between holes diameter and preform external diameter. Sintering preferably comprises a thermal treatment for the consolidation of the aerogel, in the presence of suitable gases, such as oxygen, chlorine and helium, for removing organic residues and water. Thermal treatment is preferably performed at a temperature that varies so as to perform oxidation of organic residuals in the aerogel, dehydration to remove water and, finally, consolidation of the aerogel.

Contrary to the Examiner's assertion, Arimondi discloses a sintering step (Fig. 6g) and the section relied upon by the Examiner has nothing to do with a drawing step, which is described in number paragraphs [0114]-[0115] and depicted in Fig. 6m.

The Examiner's attention is directed to Arimondi, at number paragraphs [0114]-[0115]:

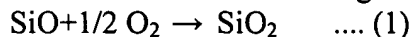
The last step of the overall process (FIG. 6m) is the drawing of the structured final preform, indicated with 71, by drawing tower 70 for obtaining the microstructured fibre 72.

During drawing, air pressure inside chamber 58 of the final preform can be set lower than 1 Bar by means of vacuum generation system 59 so as to allow tubular body 52 to collapse onto core rod 51, while hydrogen-free gas at a pressure over 1 Bar is pumped into the holes of final preform by means of pressure control device 61 so that the holes can maintain substantially the original shape while thinning during the fibre drawing process.

Since Arimondi describes that a hydrogen-free gas is pumped into the holes in the drawing step, the Examiner's conclusion that the holes in the preform would have oxygen in them is speculative. Consequently, Arimondi does not disclose or fairly suggest the presence of oxygen in the holes during the drawing step, as required in claim 1. In addition, the secondary reference to Nagayama does not remedy the above argued deficiency of Arimondi.

Moreover, the advantage of having oxygen present in the through holes during the drawing step is described in the present specification at page 8, lines 16-21 as follows:

Furthermore, oxygen gas is preferably present in the through holes 23 of the optical fiber preform 20. During drawing, SiO gas is generated in the through holes 23, as described above. However, the generation of the SiO gas can be suppressed because the equilibrium of Eq. 1 below is shifted to the right side as a result of the presence of the oxygen gas.



Thus, the presence of oxygen in the through holes 23 of the optical fiber preform 20, during drawing, advantageously suppresses SiO gas. The present invention addresses a particular problem attendant upon conventional practices of forming an optical fiber with air holes. That problem, as disclosed in the first full paragraph on page 2 of the written description of the specification, is a decrease in the transmission loss. In order to address that problem Applicants "conducted intensive studies" and found that the transmission loss is due to Rayleigh scattering at the interfaces of the air holes (paragraph bridging pages 4 and 5 of the written description of the specification).

After further studies, Applicants discovered the source of the problem, i.e., that when the microstructured optical fiber is removed from the drawing furnace and cooled, the produced SiO gas adheres to the interfaces of the air holes, and SiO is frozen before becoming stably bonded because the cooling rate of the optical fiber removed from the drawing furnace is 5000°C/second or higher (second full paragraph on page 5 of the written description of the specification). Appellants addressed and solved that problem by providing the method set forth in independent claim 1 which requires, *inter alia*, the use of an additional heating furnace subsequent to drawing, wherein the optical fiber is heated to a temperature range of 900°C to 1300°C.

The problem element generates two indicia of nonobviousness. First, it is well settled that the recognition of a source of a problem attendant upon conventional practices is, in itself, an indicium of nonobviousness. *In re Spinnoble*, 405 F.2d 578, 160 USPQ 237 (CCPA 1969). Secondly, it is well settled that the problem addressed and solved by a claimed invention must be given consideration as a potent indicium of nonobviousness. Arimondi does not envision the

problem addressed and solved by the claimed invention. *North American Vaccine, Inc. v. American Cyanamid Co.*, 7 F.3d 1571, 28 USPQ2d 1333 (Fed. Cir. 1993); *Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 15 USPQ2d 1321 (Fed. Cir. 1990); *In re Newell*, 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989); *In re Nomiya*, 509 F.2d 566, 184 USPQ 607 (CCPA 1975).

Based upon the foregoing it should be apparent that a *prima facie* basis to deny patentability to the claimed invention has not been established for lack of the requisite realistic motivation. Moreover, upon giving due consideration to the potent indicia of nonobviousness of record, stemming from Applicants recognition of the source of a problem attendant upon prior art practices, and the failure of the reference to even envision the problem addressed and solved by the claimed invention, the conclusion appears inescapable that one having ordinary skill in the art would not have found the claimed subject matter as a whole obvious within the meaning of 35 U.S.C. § 103. *In re Piasecki*, 745 F.2d 1468, 223 USPQ 785 (Fed. Cir. 1984).

Applicants, therefore, submit that the imposed rejection of claims 1 through 7 under 35 U.S.C. § 103 for obviousness predicated upon Arimondi in view of Nagayama is not factually or legally viable and, hence, solicit withdrawal thereof.

Claim 8 was rejected under 35 U.S.C. § 103 for obviousness predicated upon Arimondi in view of Nagayama and Kuwahara et al. (U.S. Pat. App. Pub. No. (2002/0174692, hereinafter "Kuwahara").

This rejection is traversed. Specifically, claim 8 depends from independent claim 7. Applicants incorporate herein the arguments previously advanced in traversing the imposed rejection of claim 1 under 35 U.S.C. § 103 for obviousness predicated upon Arimondi in view of Nagayama and Kuwahara. The additional reference to Kuwahara does not cure the previously argued deficiencies in the attempted combination of Arimondi and Nagayama.

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Applicants, therefore, submit that the imposed rejection of claim 8 under 35 U.S.C. § 103 for obviousness predicated upon Arimondi in view of Nagayama and Kuwahara is not factually or legally viable and, hence, solicit withdrawal thereof.

Based upon the foregoing it should be apparent that the imposed rejections have been overcome and that all pending claims are in condition for immediate allowance. Favorable consideration is, therefore, solicited. If there are any outstanding issues which might be resolved by an interview or an Examiner's amendment, the Examiner is invited to call Applicants' representative at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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